3G (GSM) TERMINAL CONCEPTS FOR RURAL AND URBAN EMPOWERMENT

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Abstract

The author is of the opinion that the introduced 2G GSM services were designed to be consumable services and not wealth generating ones. This paper is set to show how third generation (3G) GSM (hereafter 3G) with a well designed terminal technology can be used to transform the population from information consumers to information producers and users, which would lead to economic and social transformation of the population. The purpose of this paper is to look at some terminal design concepts, which could make 3G a development resource for community empowerment in Nigeria.

1. Background

1.1 Narrowband Telephony

The original concept which governed the introduction of GSM in early 1990s in Europe was that of narrowband subscriber telephone network [1, 2, 3]. The services provided can be described as consumable and not capital resources. At that time, the wideband services which are presently available under 3G were just dreams to be realised in very distant future [4, 5].

The introduction of 2G GSM into Nigeria in 2002 was a tremendous success. At this time of writing, the 3 dominant GSM networks, MTN, Celtel and Globacom continue to spread into remote villages and communities. Nevertheless, this widespread has not generated much needed economic benefit to the population.

1.2 The 2.5G Era in Nigeria

This complex technology is yet to reach the average user. Unlike 2G, certain 2.5G services enjoy content-based billing. Examples of 2.5G content-based billing services include: GPRS (General Packet Radio Service) and EDGE (Enhanced Data for GSM Evolution) [1, 5].

1.3 The 3G Technology as an Economic Driving Force

A 3G billing method is expected to give it a wider acceptance than 2.5G GSM in Nigeria [6,7,8,9,10]. A country with a failed PSTN (Public Switched Telephone Network) such as Nigeria is a potentially good market for 3G technology. The country is seriously in need of widely available broadband terminal services such as: Internet browsing, Internet multimedia services, Internet video conferencing, etc, which are offered by 3G technology. The 3G services are expected to change many subscribers from information consumers to information producers at both urban and rural levels of the country. It would also mean information empowerment, which would lead to economic empowerment and job creation.

As Internet gateway, 3G terminal services will compete reasonably with the present conventional Internet Service Providers (ISPs).

For this to happen, appropriate 3G terminals must be put in place. This is expected to spread the technology to most remote parts of the country.

The importance of an appropriate and well designed terminal is made abundantly clear when millions of US dollars was recently invested in the development of 3G terminals in China [11, 12].

2. Some 3G Services for Rural and Urban Community Empowerment.

The economic empowerment inherent in 3G services must not be allowed to waste without relevant and well structured approach. The services of interest in this paper are mainly those designed to create gainful employment and economic development of both urban and rural parts of Nigeria.

2.1 Web-aided Market Sourcing Services

Unlike 2G GSM, Internet services will be widely available under 3G. For the rural communities, a direct Internet link between them and their Internet market partners will be provided. Through this, greedy middlemen can be omitted from business deals.

2.2 Internet–based Direct Procurement Services

This service will link urban and rural communities with producers of capital goods such as industrial plants for direct procurement at much reduced prices.

2.3 Internet–based Distant Learning Services.

For the rural communities, access to Open Universities and other relevant institutions for lecture download and online examination services through 3G terminal can be described as academic empowerment of the best kind.

2.4 Internet–based Distant Library Services.

One of the most relevant tools for rural and urban population empowerment is learning resource such as library services. However, these services are hardly available where they are most needed in Nigeria. This is where 3G Internet services can be of crucial importance. With such a system in place, students from rural communities can access and make use of distant library services world wide and empower themselves for a better tomorrow.

2.5 Internet–aided Telephone and Fax Services

Certain voice on Internet protocol (VoIP) telephone service providers such as Net2phone, have over the years perfected Internet low cost telephone services for Internet users in metropolitan areas.

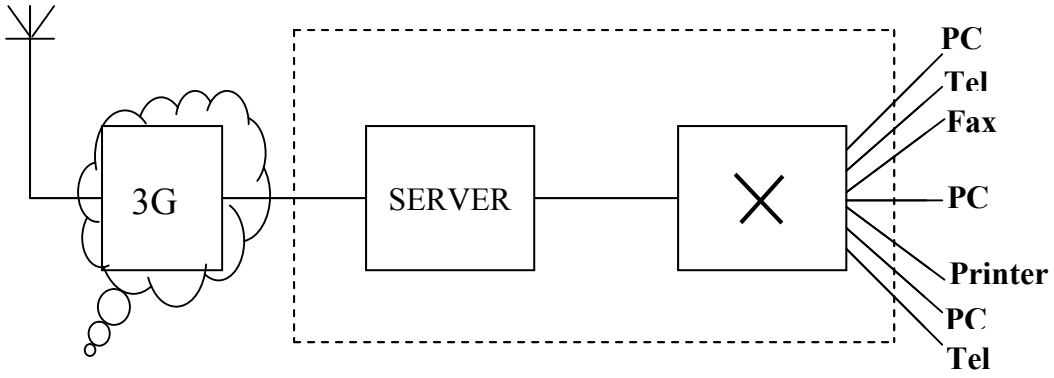
With the introduction of 3G in Nigeria, the rural population will also have access to these services but at reduced cost [13, 14]. Terminal concepts for these services are described in sections 3.3.

2.6 Direct Community Development Services

With these services, rural communities can source for information concerning international technical aid bodies and directly seek for help when needed. This direct approach is likely to reduce response time of international organisations and Non Governmental Organisations (NGOs).

3. The 3G Terminal Concepts

Fig. 1.0: A 3G GSM Terminal



Over the years, several technical support networks and tools such as communication satellites, the Internet, personal computers, Global Positioning Systems (GPS), 2G GSM, etc, were introduced for human and technological development. Some countries reacted and designed appropriate interfaces or terminals to connect into these vital resources. An earlier example of a country's response to a global technological invention is the German T-Online. T-Online is an Internet software terminal, which greatly simplified the use of the Internet in early 1990s in Germany [15]. Generally, those that reacted appropriately to great inventions reaped maximum technological, economic and social benefits. Those that failed to respond remained left out. Response to major technical inventions should be a national policy. Failure to do this would mean an endless race of "catching up".

The introduction of 2G GSM in Nigeria was not followed by a national Terminal design policy. As a result, GSM could not become an economic driving force and capital good. The ability and capacity of a country to respond to global innovation such as 3G GSM is determined by the country's well developed technological response strategy, with which to reap maximum benefit from such global innovations. We must not repeat the mistakes of 2G/2.5G GSM.

3.1 A Simple 3G Terminal

A 3G network is a dynamic, flexible and yet very powerful technological system. If the present national coverage of GSM networks, which extends into very remote villages, can be repeated in the spread of 3G, simple laptops can be configured to act as terminal LAN network servers, which can be used by rural communities to access the internet, make phone calls, and directly sell their products in the global market.

At a 3G download data rate of over 2Mbps, several information files and multimedia content can be received and stored in the laptop memory for future use. The laptop approach is very appropriate for an environment with unreliable power supply.

Thus, with a simple laptop server, a printer and few VoIP (Voice over Internet Protocol) telephones, an information service provider with some support personnel can serve a rural community offering latest Internet services and linking the people to the outside world. And without leaving their villages, job seekers can search, apply and attend online interviews.

3.2 A High Capacity 3G Terminal

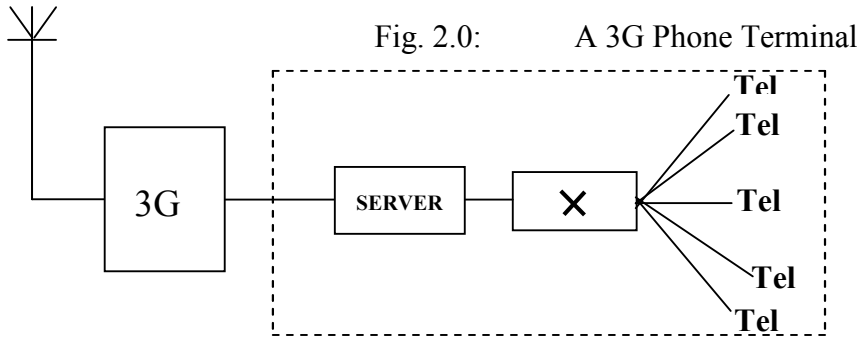
With 3G, a well planned terminal should enable a professional Internet service provider operates in large part of the country including many rural areas. This advanced 3G terminal is expected to offer Internet services, which are close or better than those presently offered

by conventional ISP's. This is technically possible because 3G can provide data rates in excess of what obtains in some of the ISPs in Nigeria today. But as stated earlier, providers of 3G services must agree to give the necessary support to make 3G a useful resource for the development of Nigeria.

To offer reliable Internet services to rural and urban communities, the terminal must have the structure of an Internet LAN (Local Area Network). This terminal concept requires reliable and high speed servers, with which some of the best 3G services can be utilised.
Services are expected to be delivered at a much faster rate than some of the ISP's. At the heart of the advanced 3G terminal concept is a high speed server. This concept can be judged as the most appropriate for an advanced network such as 3G.

3.3 Special Service Terminals

Fig. 2.0: A 3G Phone Terminal



For a rural community empowerment, offices and individuals must be offered low cost Internet telephone and fax services [13,14]. For this group, the terminal network described earlier must be extended to include phone and fax services from world class providers such as Net2phone.
Net2phone and similar low cost VoIP [4] telephone service providers are known for reliable phone and Fax services. To maximize these services, multi-user versions of the applications are required to be installed in the server followed by several telephone boxes. The telephone boxes are designed to give some degree of privacy to users. With this arrangement, users will be empowered to use phone and fax to run their business at relatively reduced cost. And like conventional cyber café, far more jobs will be created at both rural and urban areas than is presently possible under normal GSM [16].

3.4 Recommendation

To have a significant impact on the economy and empower the rural and urban communities of Nigeria, I strongly recommend an advanced 3G terminal as described in sections 3.2. As mentioned in the said section, such a terminal must offer good internet services comparable to those offered by conventional ISPs in metropolitan cities.

4. Conclusion

In this paper, the importance of appropriate response to world technological innovations, as it applies to 3G, was highlighted.
To make the introduction of 3G GSM bring much needed technological advancement and community empowerment, the paper strongly suggest well designed terminal networks for both rural and urban applications. It was clearly put that only an appropriate terminal

design can reap maximum benefit from big inventions such as 3G GSM. The terminal concepts suggested can be realised with modern and available technologies.
The Federal Government of Nigeria and Stakeholders should seriously look into the issue of appropriate terminal design as recommended in this paper. Only the Government and licensing authorities can make licence applicants and telecommunication operators offer relevant and job creating services to the Nigerian people at an affordable price. Only Government and Stakeholders can make operator provide a good interface and protocol, through which a well designed terminal can access their network and empower the communities.
It should be noted that a deep sea port without excellent facilities for ships is a useless sea port. Ships will avoid such port and move elsewhere. Nigeria will rise up to new technological innovations and will not lose its place in a world governed by Internet and Telecommunication advancement.

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